

### **REMARKS**

Prior to entry of this amendment, claims 1-20 are currently pending in the subject application. By the instant amendment, claims 1 - 20 are amended to correct for indefiniteness issues raised by the Examiner. Claims 1, 6, 9 and 14 are independent.

Applicants appreciate the Examiner's acknowledgement of applicants' claim for foreign priority and receipt of a certified copy of the priority document.

Claims 1 - 20 are presented to the Examiner for further prosecution on the merits.

#### **A. Introduction**

In the outstanding Office action, the Examiner objected to the drawings, objected to claims 1-20, rejected claims 1-20 under the second paragraph of 35 U.S.C. § 112, rejected claims 1, 2, 5-7, 12-14, 17, 18 and 20 under 35 U.S.C. § 103(a) as being obvious in view of U.S. Patent No. 6,473,467 to Wallace et al. ("the Wallace et al. reference") in view of U.S. Patent No. 5,960,039 to Martin et al. ("the Martin et al. reference"), rejected claims 3, 4, 8, 10, 15 and 19 under 35 U.S.C. § 103(a) as being obvious in view the Wallace et al. reference in view of the Martin et al. reference, further in view of the 3GPP paper, and indicated claims 11 and 16 contained allowable subject matter.

#### **B. Asserted Objection to the Drawings**

In the outstanding Office action, the Examiner objected to the drawings as failing to show every feature recited in claim 13. In particular, the Examiner stated that the storing of claim 13 was not shown in the drawings. It is respectfully submitted that this is a method limitation, and drawings are not required. *See MPEP* § 601.1(f). Further, this limitation is shown by the information restoring unit 110 of the transmitter 100, as disclosed, for example,

on page 11, lines 7-10 of the original specification. Therefore, it is respectfully requested that this objection be withdrawn.

C. Asserted Objection of Claims 1-20

In the outstanding Office action, the Examiner objected to claims 1-20 for a number of noted informalities. These informalities have been corrected generally as suggested by the Examiner, except regarding the channel state in claims 2, 6, 7, and 9, which is believed to have been otherwise clarified by the present amendment. The different feedback signals have now been numbered for clarity. Therefore, it is respectfully requested that this objection be withdrawn.

D. Asserted Rejection of Claims 1-20 under 35 U.S.C. § 112

In the outstanding Office action, the Examiner rejected claims 1-20 under the second paragraph of 35 U.S.C. § 112. The claims have been amended to address these concerns, as set forth below.

First, the Examiner indicated that the term “lower-dimension(al)” used in claims 1, 3 and 19 was unclear. These claims have been amended to clarify that the approximated weight has fewer dimensions than the original weight, as set forth, for example, on page 7, lines 21-31 of the original specification.

Second, the Examiner indicated the plural recitations of “a radio frequency signal” in claims 1 and 6 was unclear. These claims have been amended to more clearly define the relationship between these signals.

Third, the Examiner indicated the recitations of “a feedback information” and “the feedback information” in claims 9 and 14 was unclear. These claims have been amended to

more clearly define the relationship between the information.

Fourth, the Examiner indicated the phrase “the approximated dimension or indices” in claim 9 was unclear. This claim has been amended to clarify this relationship. Tables 1-3 of the original specification illustrate the relationship between the quantization coefficients and corresponding indices.

Fifth, the Examiner indicated that the phrase “the inner product” in claim 11 is unclear. It is respectfully submitted that this is a term of vector calculus indicating a function that outputs a scalar. This function is also referred to as the dot product. If the Examiner indicates the term “dot product” is preferable, the Applicant will amend claim 11.

Sixth, the Examiner indicated that the recitation of “ $M C_S$ ” and “ $N^S$ ” in claim 16 is unclear. It is respectfully submitted that these terms are just indicating the number of cases to be repeated, as shown in FIG. 5B and as disclosed on page 9, lines 30-35. Since M, N and S are all defined in claim 16, it is respectfully submitted the number of cases is clear.

Seventh, the Examiner requested clarification of claims 17 and 18. These claims have been amended and are believed to clarify the present invention.

The remaining claims depend, either directly or indirectly from respective ones of the claims discussed above. Therefore, it is respectfully requested that these objections be withdrawn.

E. Asserted Obviousness Rejection of Claims 1, 2, 5-7, 12-14, 17, 18 and 20

In the outstanding Office action, the Examiner rejected claims 1, 2, 5-7, 12-14, 17, 18 and 20 under 35 U.S.C. § 103(a) as being obvious in view of the Wallace et al. reference in view of the Martin et al. reference. This rejection is respectfully traversed for at least the

reasons set forth below.

Regarding claims 1 and 6, while the Wallace et al. reference may disclose using a subset of channel response matrices to reduce the amount of information transmitted, it is respectfully submitted that this teaching does not disclose or suggest approximating a second weight from a calculated first weight of a first dimensionality corresponding to the number of the transmitting antennas, the second weight having a second dimensionality, the second dimensionality being lower than the first dimensionality, as set forth in claim 1, or selecting a number of basis vectors and their coefficients corresponding to the dimensionality of approximation among the basis vectors whose number corresponds to the number of the transmitting antennas, obtains a plurality of weights from the selected basis vectors and coefficients, extracts a weight that maximizes a predetermined objective function, as set forth in claim 6.

Equation (2) in the Wallace et al. reference, also relied on by the Examiner, appears to be used for all antennas, and FIG. 6 in the Wallace et al. reference also does not appear to show any approximation. The Martin et al. reference fails to provide this missing teaching.

Regarding claim 9, this claim was not specifically addressed in the body of the rejection. It is respectfully submitted that the Wallace et al. reference and the Martin et al. reference fail to disclose or suggest “approximating the weight as dimension S which is less than M,” as recited in claim 9.

Regarding claim 14, this claim was not specifically addressed in the body of the rejection. It is respectfully submitted that the Wallace et al. reference and the Martin et al. reference fail to disclose or suggest “selecting S basis vectors among the determined basis

vectors where S is less than M,” as recited in claim 14.

Therefore, it is respectfully submitted that neither the Wallace et al. reference nor the Martin et al. reference, either alone or in combination, disclose or suggest the present invention as set forth in the independent claims 1, 6, 9 and 14. The remaining rejected claims depend, either directly or indirectly, from respective ones of claims 1, 6, 9 and 14, and are believed to be allowable for at least the reasons set forth above regarding their respective base claims. Therefore, it is respectfully requested that this rejection be withdrawn.

F. Asserted Obviousness Rejection of Claims 3, 4, 8, 10, 15 and 19

In the outstanding Office action, the Examiner rejected claims 3, 4, 8, 10, 15 and 19 under 35 U.S.C. § 103(a) as being obvious in view of the Wallace et al. reference in view of the Martin et al. reference, further in view of the 3GPP reference. These claims depend, either directly or indirectly, from respective ones of claims 1, 6, 9 and 14, and are believed to be allowable for at least the reasons set forth above regarding their respective base claims. While the 3GPP reference may disclose the predetermined function recited in these claims, the 3GPP reference fails to provide the teaching noted above as missing in the combination of the Wallace et al. reference and the Martin et al. reference. Therefore, it is respectfully submitted that these claims are similarly allowable, and it is requested that this rejection be withdrawn.

G. Allowable Subject Matter )

The indication that claims 11 and 16 contain allowable subject matter is gratefully acknowledged. However, it is respectfully submitted that all of the claims are in condition for allowance.

H. Conclusion

Since the cited prior art references neither anticipate nor render obvious the subject invention as presently claimed, applicants respectfully submit that claims 1-20 are now in condition for allowance, and a notice to that effect is respectfully requested.

The remaining documents cited by the Examiner were not relied on to reject the claims. Therefore, no comments concerning these documents are considered necessary at this time.

If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing amendments and remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

Respectfully submitted,

LEE & STERBA, P.C.

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If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

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